Remarks

The present application is a divisional application of pending application 09/372,274 (the "parent") by Rodgers, et al. filed on August 11, 1999. On entry of this amendment, claims 2-16 are pending. The specification has been amended to remove typographical errors. The drawing is amended as shown in the enclosed marked up copy of sheets 24/33, 28/33, and 29/33. Substitute drawing sheets are enclosed for use in examination. A Letter to the Official Draftsperson is enclosed with substitute drawing sheets for entry. A marked-up version of the amendment to the specification is enclosed. No marked up copy of the claims is deemed necessary since only new claims are now pending. No new matter is submitted.

The Examiner is invited to telephone the undersigned at the telephone number listed below if it would in any way advance prosecution of this case.

Respectfully submitted,

Date: August 2, 2001

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Version with Markings to Show Changes Made

In the Specification

The paragraph starting on page 1, line 11 was modified as follows:

This application is a Divisional application of, and claims priority from, U.S. patent application no. 09/372,274 by Rodgers, et al., filed August 11, 1999, which is a Continuation-In-Part application of, and claims priority from, U.S. Patent Application Serial Number 09/233,755 by Rodgers, et al., filed on January 20, 1999, which is a Continuation-In-Part application of U.S. Patent Application Serial Number 09/088,924, by Rodgers, et. al, filed on June 2, 1998[.], now abandoned. These related applications are incorporated herein by reference..

The paragraph starting on page 3, line 10 was modified as follows:

The monitor may further include [the second] a second receiver providing phase detection, or a signal analyzer providing phase detection. Phase detection [providing] provides phase information regarding the received response signal. The processor may further determine the second frequency in accordance with the phase information. Phase information varies over a wider range of values near a resonant frequency. By determining the second frequency in accordance with phase information, the second frequency may be more accurately determined. Communication with a more accurate second frequency improves the efficiency of transferring operative power to a transceiver, permits faster or more accurate identification of transceivers, extends the operating range of the monitor, overcomes problems of detrimental orientation discussed above, or permits faster or more accurate data transfer between the monitor and a single transceiver.

The paragraph starting on page 50, line 2 was modified as follows:

TABLE 6

Transmitter Type	Reply Frequency
Colpitts Oscillator	Tank resonant frequency when transceiver operates in isolation; any stack resonant frequency when within a stack; between tank resonant frequency and stack resonant frequency when loosely coupled to a stack (e.g., on an end or in non-coplanar orientation).
Phase Locked Loop	As driven by carrier from monitor 124 (e.g., at an isolated tank resonant frequency, a stack resonant frequency, or any other desirable [frequency.]frequency). The carrier frequency may be selected for any one or more of the following reasons: (a) to avoid the carrier being masked by interfering frequency components (e.g., of antenna system 121, or of signal 193); (b) to avoid the reply being masked by interfering frequency components (e.g., of antenna system 121 or of signal 193); (c) to assure adequate power transfer to enable one or more transceivers; and (d) to prevent adequate power transfer or adequate received signal quality from enabling one or more transceivers not currently of interest. For example, if a stack resonant frequency has been detected at 4.3 MHz, the monitor may transmit at a predetermined offset (e.g., less 500 KHz) from 4.3 MHz to interrogate a transceiver loosely coupled to the stack (e.g., at an end of a linear stack) whether or not a response (e.g., a ring signal) was detected at that offset.

The paragraph starting on page 58, line 30 was modified as follows:

TABLE 7

Command/Answer	Description
N <Antenna Node> <Antenna Address> <Antenna Mode> <Gain> <Frequency>	Direct the set up and selection of antennas for a monitor to use in a specified mode (e.g., transmit, receive, test). Set antenna node RF channel operating parameters. Specify a frequency for antenna node tuner to use to tune the selected antenna(s).
No [response]answer.	An acknowledge answer may be used.
G <Squelch delay> <Squelch width> <Receive delay> <DSP Start-up Delay> <DSP Sample Count> <DSP Mode> <Ch. A Mode> <Ch. A Signal Source> <Ch. A Gain> <Ch. A Filtering> <Ch. A Clock> <Ch. A Output> {etc. for Ch. B}	Specify Monitor receiver operating parameters and analog switch settings. Squelch delay facilitates beginning squelch at a zero crossing of energy on the antenna(s) to be squelched. Squelch width corresponds to duration D434. Receive delay may direct beginning receiving on or after the T416 (e.g., at times A or B as discussed above). DSP sample count conveys the number of samples to be taken (e.g. 32 :sec window for FFT calculation). DSP mode may be as defined by an integrated circuit DSP (e.g., TI320 marketed by Texas Instruments). Ch. A/B mode may direct transmit, receive, or both (loop back) Ch. A/B Signal Source may select same source for two receive channels. Ch. A/B clock source may direct frequency and phase (e.g., 0°, +90°) for signal SC. Ch. A/B output may direct which of several

Command/Answer	Description
No answer.	detectors is/are used. An Acknowledge answer may be used.
C {Ch. A antenna arguments} {Ch. B antenna arguments} <Start frequency> <End frequency> <Frequency stepping>	Directs the set up and selection of antennas for each (e.g., A and B) receiver in the Monitor with arguments similar to N command. Requests amplitude results (e.g., received amplitude or received power) from each receiver in a specified range of frequencies (i.e., bins) by specifying the bin number range to be reported (e.g., from bin 123 to bin 885). May specify an increment between bins (e.g., report every fifth bin).
{<Ch. A Detector Output at Bin p>} … {<Ch. B Detector Output at Bin q>} …	Reports up to 1024 amplitude values for each channel (e.g., p = 0 to 1023; and q = 0 to 1023). May substitute DSP output when FFT results are desired.
O {<Header> <Level> <Access Code>} …	Interrogate a group, subgroup, or particular transceiver. The list Header may define a sequence and number of arguments (e.g., level and access code) in the O command. One or more N command arguments may precede the list.
{<Ch. A at Reply Slot p>} … {<Ch. B at Reply Slot q>} …	An integer for each of two receive channels (e.g., A and B) is provided for each of 1024 reply slots (e.g., p = 0 to 1023; q = 0 to 1023). Result depends on G and N command values for antenna, receiver, and DSP operating modes. The integer may represent any of the

Command/Answer	Description
	following: (a) whether amplitude (or power) exceeded a threshold value; (b) a magnitude of a detected amplitude (or power); (c) a magnitude of a frequency component (e.g., as provided by an FFT calculation). In an expanded version, the answer may include a list of integers for each integer in (b) for time domain sampling and (c) for frequency domain results.

The paragraph starting on page 65, line 4 was modified as follows:

TABLE 9

Command/Answer	Description
A <Antenna Node Address>	Read status of input register(s) (e.g., manual switches), status of output register(s) (e.g., current matrix switch settings, squelch settings, tuner settings, RF channel settings, feedback settings, any memory address (e.g., antenna node software version, tuner calibration date, number of installed antennas, etc.).
<Antenna Node Address> <Answer Data Length> <Answer Data> <Checksum>	Several different commands may be used to obtain status in part.

Command/Answer	Description
B <Antenna Node Address> <Settings Data Length> <Settings Data> <Checksum> No answer.	Set output register(s) contents to specify antenna configuration, antenna(s) coupling to transceiver channel(s), squelch settings for each channel, tuner settings for each channel, feedback settings for each channel. An Acknowledge answer may be used.[.]
C <Antenna Node Address> <Configuration Data Length> <Configuration Data> <Checksum> No answer.	Set configuration data in memory including antenna node address, antenna addresses, function(s) to be executed on manual switch closure, table of tuning settings (e.g., relay closures vs. frequency), table of antenna settings (e.g., relay closures vs. frequency or configuration identifier), any memory address (e.g., tuner calibration date, number of installed antennas, etc.). Several different commands may be used to specify configuration in part. An Acknowledge answer may be used.

The paragraph starting on page 67, line 8 was modified as follows:

Output register 2910 receives data from data bus 2906, stores such data, and maintains output signals in accordance with stored data. Signals provided by output register 2910 direct operation of coupler 2912 and transceive channels 2918. Output register signals on line 2913 control coupler 2012 [9] (e.g., configuration and matrix switch operations). Squelch command signals on line 2921 direct antenna squelching functions of squelch circuit 2920. Tuning signals on line 2923 direct tuning functions of tuner 2922. Finally, digital signals on line 2927 control

operation of transceiver channels 2924 (e.g., specifying preamplifier gain, automatic gain control, and filter transfer functions). Output register signals on lines 2913, 2921, 2923, and 2927 are binary digital signals and may be used in common across multiple transceive channels 2918, or additional digital signals may be provided by output register 2910 for each transceive channel.

The paragraph starting on page 74, line 10 was modified as follows:

Antenna 3401 is constructed in the plane defined by points A, B, C, D, i.e., in a plane parallel to the XZ plane at the opening of the passage furthest on the Y axis from origin 3510. Antenna 3402 is parallel to antenna 3401 yet closer to origin 3510. Movement of a transceiver along an axis through the passage parallel to the y axis may be determined by examination of the time when the peak reply signal strength is received from each of antennas 3401 and 3402. Antenna 3403 is again parallel to the XZ plane and in addition exists at the mid-point of the passage (e.g., each point J, K, L, exists at the mid-point of a segment NB, OC, PD parallel to the Y axis). Antenna 3404 may be arranged at an angle [a]$\underline{\alpha}$ = 45° when passage 3500 is essentially cubic in geometry. Similarly, antenna 3405 may be perpendicular to antenna 3404 when passage 3500 is essentially cubic. Antenna 3406 is oriented in a plane having angles α = 135° and [y]$\underline{\gamma}$ = 135° and is of the type described in related patent application S/N 09/233,755, cited above. Antenna 3407 has an orientation complimentary to antenna 3406. Antenna 3408 lies in a plane parallel to the ground plane 3501. Antenna 3409 and antenna 3410 are parallel to the YZ plane and may be constructed in sides 3506 and 3507, respectively.

The paragraph starting on page 74, line 24 was modified as follows:

Transceive channel circuitry, particularly squelch circuit 2920 should be located as specified in the Table for optimum performance (minimal generation of out-of-band noise). Points [T.U.]T, U, and V bisect segments LK, HG, and DC respectively. Point [5]S bisects segment PK.

The paragraph starting on page 74, line 31 was modified as follows:

Any antenna of antennas 150 may be constructed of multiple loops as a planar antenna. Particular advantages are obtained in system 100 by using an antenna of the type described in FIG. 36. Antenna 3600 includes three loops and terminals 3601, 3602, 3603 referenced to a common terminal 3611. Loops may be formed of any conductor including a shielded conductor for limiting E-field radiation while sending or receiving magnetic field radiation. In addition, antenna 2916 includes Q modifying circuit 3604. Q modifying circuit 3604 includes diode D3612, diode D3614, and resistor R3616, all connected in parallel from terminal 3610 to [terminal]<u>terminals</u> 3611. In operation, a transmit signal, for example, signal TRA on line 2925 through coupler 2912, may be imposed across two terminal: a first selected from the set consisting of terminals 3601, 3602, and 3603; and a second selected from the set consisting of 3610 and 3611. When terminal 3610 is used, a transmit signal of suitable magnitude may forward bias diodes D3612 and D3614 to shunt resistor R3616. A relatively high Q antenna circuit results. On the other hand, a signal received by antenna 2916 having a signal magnitude insufficient to forward bias diodes D3612 and D3614 will pass through resistor R3616. A relatively low Q antenna circuit results. A lower Q antenna is typically characterized by a wider band sensitivity than a higher Q antenna. When transmitting energy intended to power one or more transceivers, a higher Q antenna is preferred.

Propsal Figs 26, 27, 32, 33 approved
B.C.

TOZOBO" 95612660

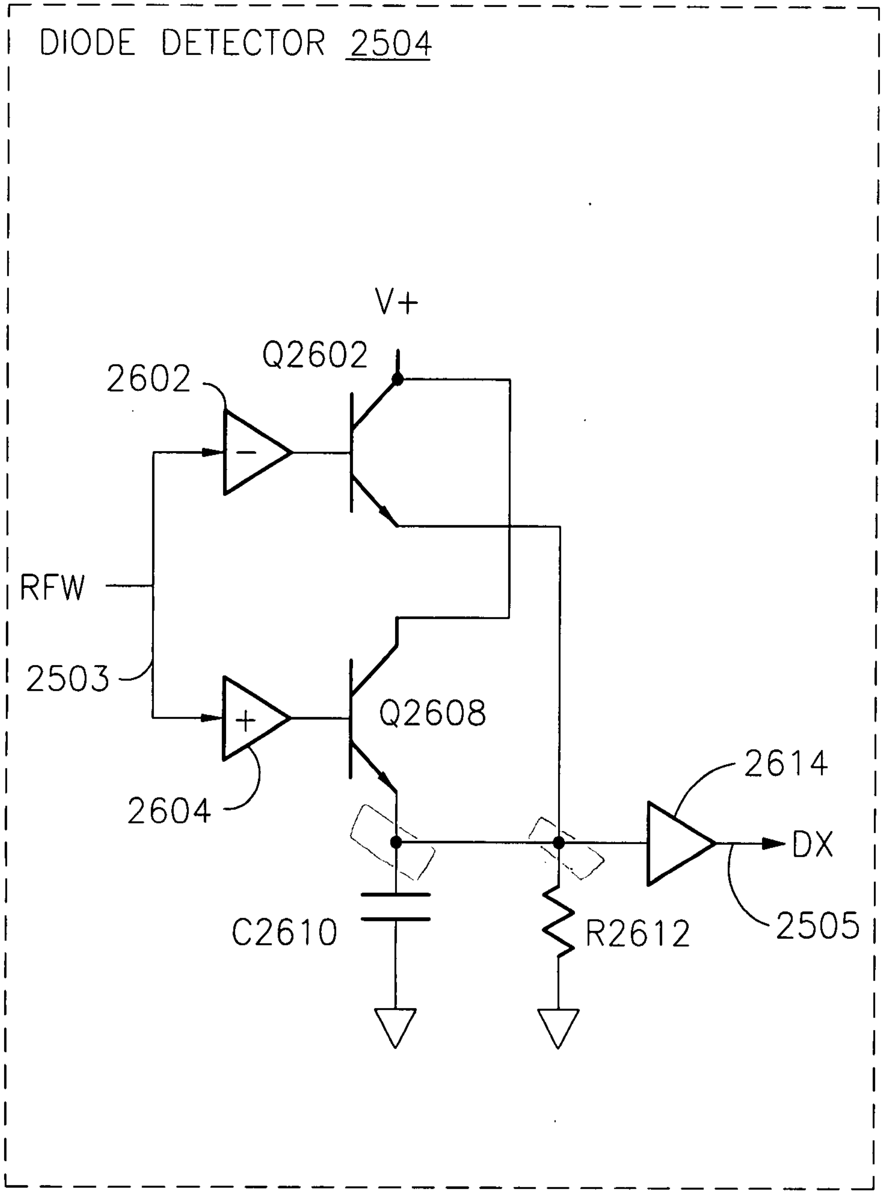

FIG. 26

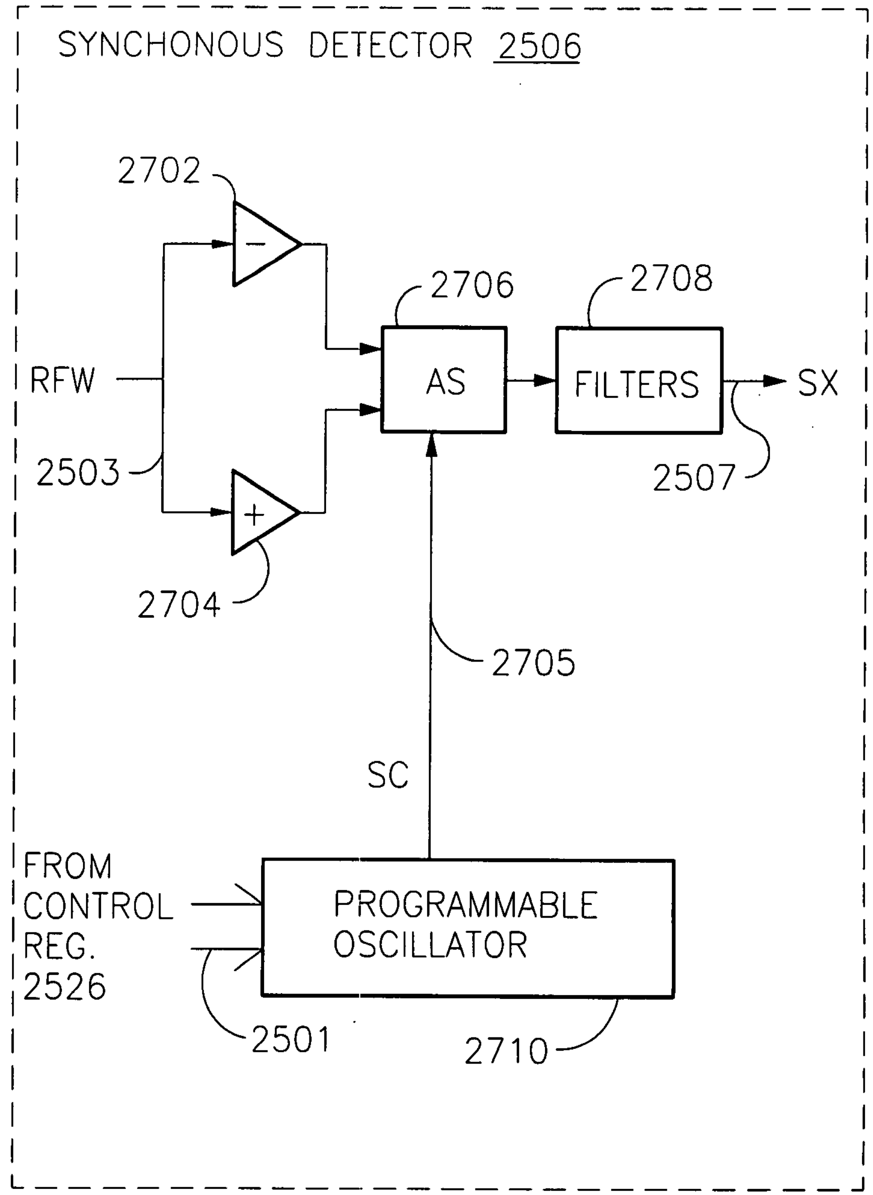

FIG. 27

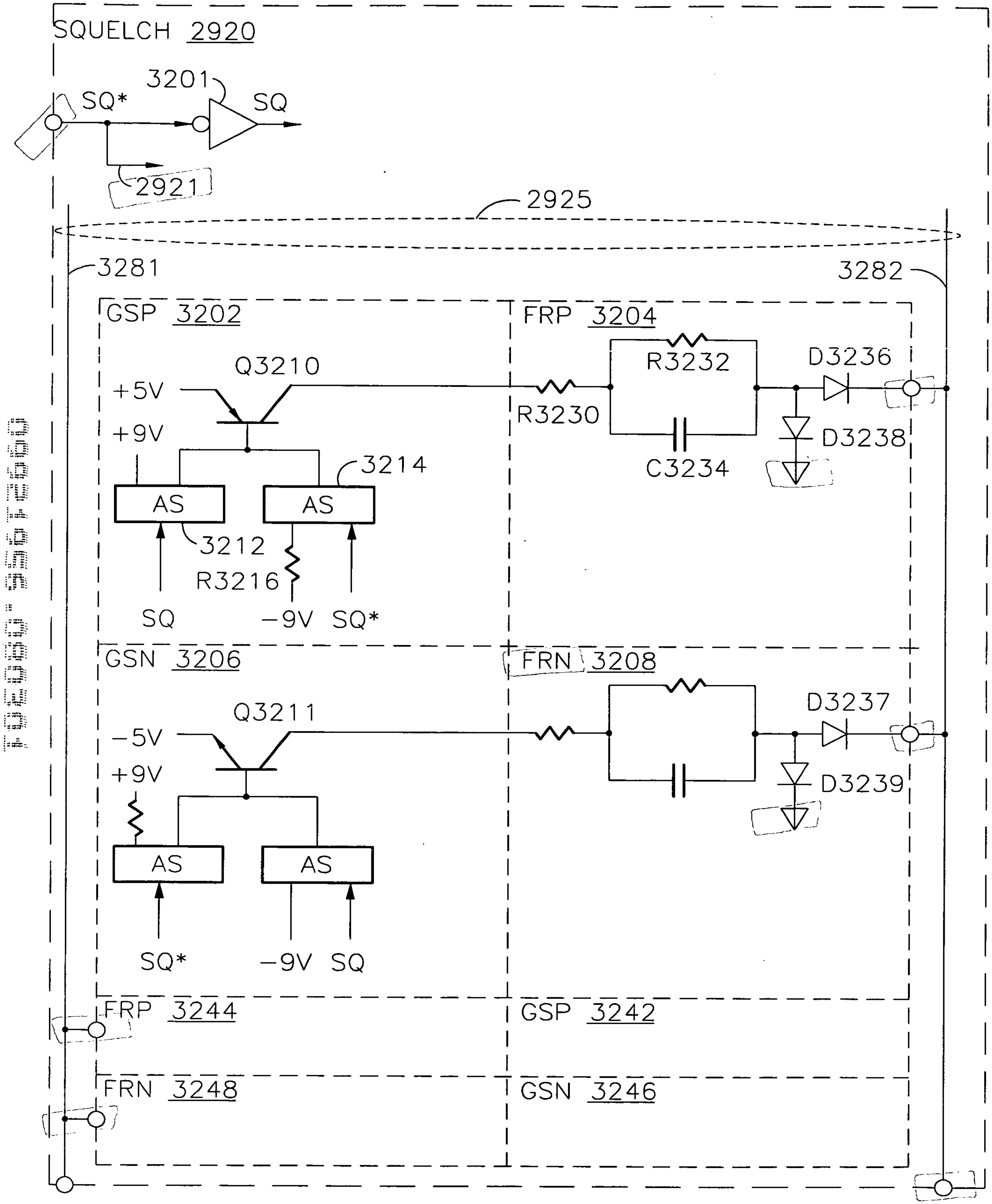
SQUELCH 2920
3201
SQ*
SQ
2921
2925
3281
3282
GSP 3202
FRP 3204
Q3210
+5V
+9V
R3232
D3236
R3230
D3238
C3234
3214
AS
AS
3212
R3216
SQ
−9V
SQ*
GSN 3206
FRN 3208
Q3211
−5V
+9V
D3237
D3239
AS
AS
SQ*
−9V
SQ
FRP 3244
GSP 3242
FRN 3248
GSN 3246

FIG. 32

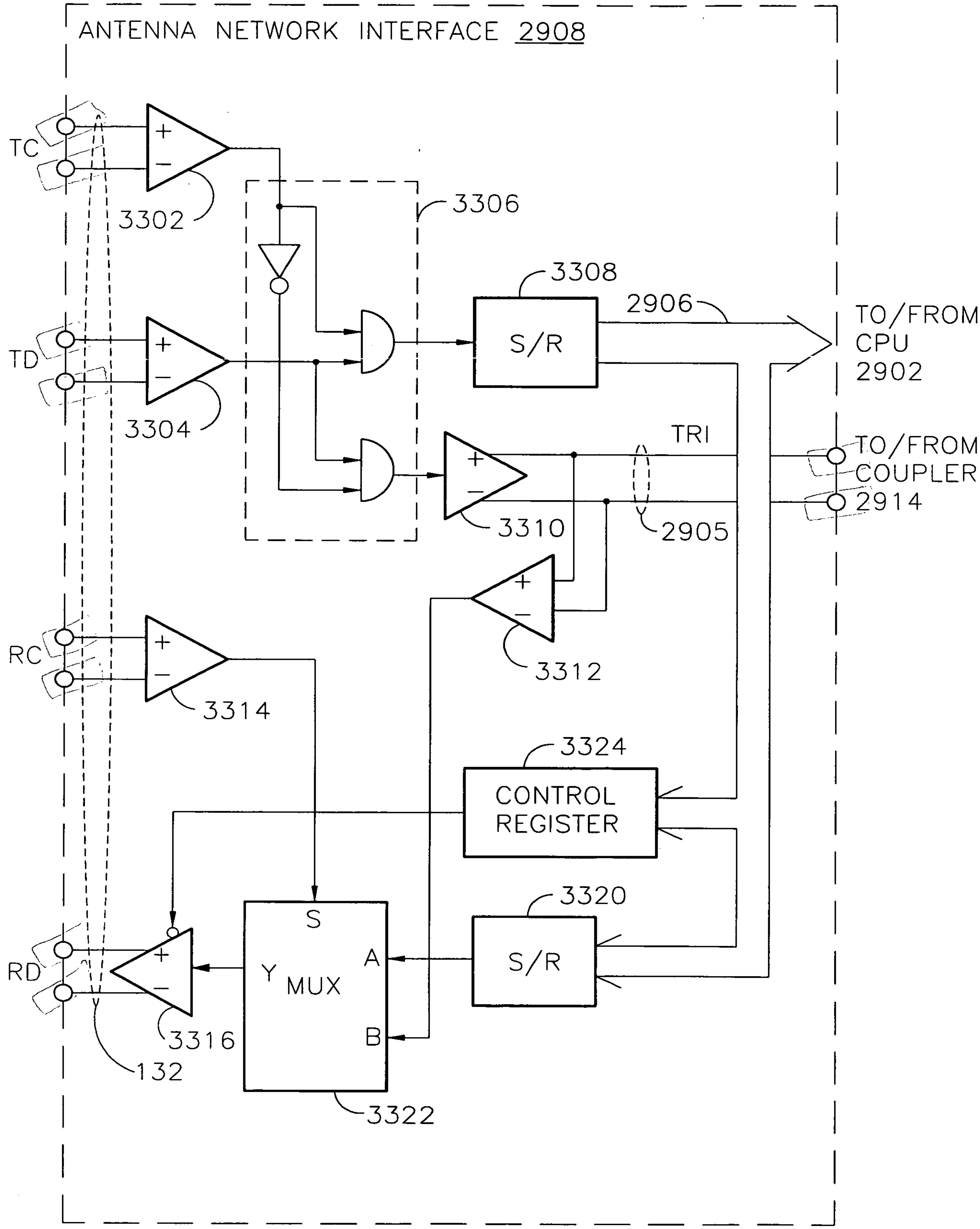
ANTENNA NETWORK INTERFACE 2908
TC
3302
3306
3308
2906
TO/FROM CPU 2902
S/R
TD
3304
TRI
TO/FROM COUPLER 2914
3310
2905
3312
RC
3314
3324
CONTROL REGISTER
3320
S
A
Y MUX
B
S/R
RD
3316
132
3322

FIG. 33